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09/575,609	05/22/2000	Robert Johannes Sluijter	PHN-17.448	1464

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EXAMINER	
PATEL, KINARI M	

ART UNIT	PAPER NUMBER
2654	16

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/575,609	SLUIJTER ET AL.	
	Examiner	Art Unit	
	Kinari Patel	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 12/29/03.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 22 May 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 9-11, 13, 15, 17, 19, 21, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taori (US Patent 6,078,879).

As per claim 1, Taori discloses a transmission system comprising a transmitter with an encoder for encoding an audio signal (column 1, lines 38-39), the encoder comprises frequency determining means for determining a frequency of at least one periodical component of the audio signal (column 4, line 55, Table 2: pitch depends on frequency), the transmitter further comprises transmitting means for transmitting a signal representing said frequency to a receiver, said receiver comprises receiving means for receiving a signal representing said frequency from the transmitter (column 3, lines 3-8) and a decoder for deriving a reconstructed audio signal on the basis of said frequency (column 3, lines 12-14), wherein the encoder further comprises frequency change determining means for determining a frequency change of said at least one periodical component of the audio signal over a predetermined amount of time (column 4, lines 45-48 and lines 55-58; column 12, lines 4-9, Figure 3, 32, 34: the analysis means contained in the encoder

contains the pitch tuning means that determine a frequency change, referred to as the Pitch Range Computer and the Refined Pitch Computer).

Taori et al. fails to explicity disclose the frequency change be used by said decoder for deriving said reconstructed audio signal. However, it is obvious in the art that frequency change be used by said decoder for deriving said reconstructed audio signal. The purpose of a decoder is to reconstruct the audio signal using the same parameters that the encoder used, i.e. in the instant case the frequency, after the audio signal is passed through the encoder. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Taori wherein the frequency change is used by the decoder for deriving said reconstructed audio signal because a decoder's main function is to reconstruct a signal that passes through an encoder with the same parameters that the encoder used to encode the signal.

As per claim 2, Taori discloses a transmission system according to claim 1. Taori further discloses a transmission system according to claim 1, wherein the transmitting means are arranged for transmitting a further signal representing said frequency change to the receiver, the receiver is arranged for receiving said further signal (column 3, lines 6-7, Figure 1, 2, 5: the transmitter is capable of transmitting a frequency change to the receiver, as the output signal of the transmitter is conveyed to a receiver), and in that the decoder is arranged for deriving said reconstructed audio signal also on the basis of said frequency change (column 3, lines 12-16, the output signal of the receive processing means is passed to speech decoder which converts its input signal to a reconstructed speech signal).

As per claim 3, a transmission system according to claim 1, wherein the encoder comprises means for determining a fundamental frequency from the audio signal using said frequency change (column 7, lines 13-14: the pitch frequency candidate selector is the means for determining the fundamental frequency).

As per claim 9, Taori discloses a transmitter with an encoder for encoding an audio signal (column 1, lines 38-39), the encoder comprises frequency determining means for determining a frequency of at least one periodical component of the audio signal (column 4, line 55, Table 2: pitch depends on frequency), the transmitter further comprises transmitting means for transmitting a signal representing said frequency (column 3, lines 3-7, Figure 1, 2, 5: the transmitter is capable of transmitting a frequency change to the receiver), wherein the encoder further comprises frequency change determining means for determining a frequency change of said at least one periodical component of the audio signal over a predetermined amount of time (column 4, lines 45-48, lines 55-58; column 12, lines 4-9, Figure 3, 32, 34: the analysis means contained in the encoder contains the pitch tuning means that determine a frequency change, referred to as the Pitch Range Computer and the Refined Pitch Computer).

Taori et al. fails to explicity disclose the frequency change be used by said decoder for deriving said reconstructed audio signal. However, it is obvious in the art that frequency change be used by said decoder for deriving said reconstructed audio signal. The purpose of a decoder is to reconstruct the audio signal using the same parameters that the encoder used, i.e. in the instant case the frequency, after the audio signal is passed through the encoder. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the

method of Taori wherein the frequency change is used by the decoder for deriving said reconstructed audio signal because a decoder's main function is to reconstruct a signal that passes through an encoder with the same parameters that the encoder used to encode the signal.

As per claim 10, Taori discloses the transmitter according to claim 9, wherein the transmitting means are arranged for transmitting a further signal representing said frequency change (column 3, lines 3-7, Figure 1, 2, 5: the transmitter is capable of transmitting a frequency change to the receiver).

As per claim 11, a transmitter according to claim 9, wehrein the encoder comprises means for determining a fundamental frequency from the audio signal under use of said change of said fundamental frequency over a predetermined amount of time (column 7, lines 13-14: the pitch frequency candidate selector is the means for determining the fundamental frequency).

As per claim 13, Taori discloses a receiver comprising receiving means for receiving an encoded audio signal representing an audio signal by at least a frequency of at least one periodical component of the audio signal, wherein the receiver is arranged for receiving a further signal representing a frequency change of said at least one periodical component of said audio signal over a predetermined amount of time (column 1, lines 38-39; column 4, lines 55-58, Table 2, column 3, lines 3-8), and a decoder for deriving a reconstructed audio signal on the basis of said frequency, and the decoder is arranged for deriving said reconstructed audio signal also on the basis of said frequency change (column 3, lines 12-14; column 6, lines 66-67).

As per claim 15, Taori discloses an encoder for encoding an audio signal (column 3, lines 1-2), the encoder comprises means for determining a frequency of at least one periodical component of the audio signal (column 4, line 55, Table 2: pitch depends on frequency), and for deriving a signal representing said frequency (column 3, lines 2-6: the output of the encoder is transmitted to the transmit processing means in the form of a signal because only in the form of a signal can the transmit processing means perform conventional signal processing functions), wherein the encoder further comprises frequency change determining means for determining a signal representing a frequency change of said at least one periodical component over a predetermined amount of time (column 4, line 55, Table 2: pitch depends on frequency).

Taori et al. fails to explicity disclose the frequency change be used by said decoder for deriving said reconstructed audio signal. However, it is obvious in the art that frequency change be used by said decoder for deriving said reconstructed audio signal. The purpose of a decoder is to reconstruct the audio signal using the same parameters that the encoder used, i.e. in the instant case the frequency, after the audio signal is passed through the encoder. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Taori wherein the frequency change is used by the decoder for deriving said reconstructed audio signal because a decoder's main function is to reconstruct a signal that passes through an encoder with the same parameters that the encoder used to encode the signal.

As per claim 17, Taori discloses a decoder for deriving a reconstructed audio signal from an encoded audio signal representing said audio signal by at least a frequency of at least one

periodical component of the audio signal, and a decoder for deriving a reconstructed audio signal on the basis of said frequency, wherein the decoder is arranged for deriving said reconstructed audio signal also on the basis of a further signal representing a frequency change of said at least one periodical component over a predetermined amount of time (column 1, lines 38-39, column 4, line 55, Table 2, column 3, lines 3-8 and lines 12-14, column 4, lines 45-48 and lines 55-58; column 12, lines 4-9, Figure 3, 32, 34).

As per claim 19, Taori discloses a method for encoding an audio signal comprising determining a frequency of at least one periodical component (column 4, line 55, Table 2: pitch depends on frequency), and deriving a signal representing said frequency of at least one periodical component of the audio signal (column 3, lines 2-6: the output of the encoder is transmitted to the transmit processing means in the form of a signal because only in the form of a signal can the transmit processing means perform conventional signal processing functions), and determining a signal representing a frequency change of said at least one periodical component of the audio signal over a predetermined amount of time (column 4, lines 45-48 and lines 55-58; column 12, lines 4-9, Figure 3, 32, 34).

Taori et al. fails to explicity disclose the frequency change be used by said decoder for deriving said reconstructed audio signal. However, it is obvious in the art that frequency change be used by said decoder for deriving said reconstructed audio signal. The purpose of a decoder is to reconstruct the audio signal using the same parameters that the encoder used, i.e. in the instant case the frequency, after the audio signal is passed through the encoder. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the

method of Taori wherein the frequency change is used by the decoder for deriving said reconstructed audio signal because a decoder's main function is to reconstruct a signal that passes through an encoder with the same parameters that the encoder used to encode the signal.

As per claim 21, Taori discloses a method for deriving a reconstructed audio signal from an encoded audio signal representing said audio signal by at least a frequency of at least one periodical component of the audio signal, and a decoder for deriving a reconstructed audio signal on basis of said frequency, wherein the method comprises deriving said reconstructed audio signal also on basis of a further signal representing a frequency change of said at least one periodical component of the audio signal over a predetermined amount of time (column 1, lines 38-39, column 4, line 55, Table 2, column 3, lines 3-8 and lines 12-14, column 4, lines 45-48 and lines 55-58; column 12, lines 4-9, Figure 3, 32, 34).

As per claim 23, Taori discloses a storage medium carrying a computer program for performing a method according to claim 19 (column 1, lines 25-32).

As per claim 24, Taori discloses a signal carrying a computer program for performing a method according to claim 19 (column 1, lines 25-32).

As per claim 25, Taori discloses an encoded audio signal representing said audio signal by at least a frequency of at least one periodical component of the audio signal, wherein the encoded audio signal comprises a further signal component representing a frequency change of

said at least one periodical component over a predetermined amount of time (column 1, lines 38-39; column 4, lines 55-58, Table 2).

Taori et al. fails to explicity disclose the frequency change be used by said decoder for deriving said reconstructed audio signal. However, it is obvious in the art that frequency change be used by said decoder for deriving said reconstructed audio signal. The purpose of a decoder is to reconstruct the audio signal using the same parameters that the encoder used, i.e. in the instant case the frequency, after the audio signal is passed through the encoder. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Taori wherein the frequency change is used by the decoder for deriving said reconstructed audio signal because a decoder's main function is to reconstruct a signal that passes through an encoder with the same parameters that the encoder used to encode the signal.

As per claim 26, Taori discloses a storage medium carrying an encoded audio signal according to claim 23 (column 1, lines 25-32).

3. Claims 4, 5, 12, 14, 16, 18 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taori (US Patent No. 6,078,879) in view of Wang (US Patent No. 5,647,005).

As per claim 4, Taori discloses a transmission system according to claim 1. Taori fails to disclose the transmission system according to claim 1 wherein the encoder comprises time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined

amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal. The above features are well known in the art as taught by Wang.

Wang teaches increasing the pitch by a frequency increase (column 4, lines 57-58), and reducing the pitch of the sound signal resulting in a frequency drop (column 5, lines 8-9). Increasing the frequency is equivalent to time compressing the signal, and reducing the frequency is equivalent to time expanding the audio signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission system of Taori to further include time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal for the purpose of increasing the accuracy of the reconstruction of the audio signal.

As per claim 5, Taori discloses a transmission system according to claim 1. Taori further teaches a frequency determining means for determining the frequency of at least one periodical component of the signal (column 4, line 55, Table 2), and a frequency change determining means for determining a frequency change of at least one periodical component of an audio signal (column 4, lines 45-48 and lines 55-58; column 12, lines 4-9). Taori fails to disclose the transmission system according to claim 1, wherein the frequency change determining means

comprise time transform determining means for deriving a plurality of time transformed audio signals, each corresponding to a different time transform, and in that the time transform determining means comprise selection means for selecting the time transform corresponding to the time transformed audio signal having the smallest frequency change over said predetermined amount of time.

It is obvious to include the above features because if the frequency change of one audio signal can be determined, the frequency change of a plurality of audio signals can also be determined, and subsequently choosing the signal with the smallest frequency change amongst the plurality of audio signals. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission system of Taori to further include frequency change determining means comprises time transform determining means for deriving a plurality of time transformed audio signals, each corresponding to a different time transform, and in that the time transform determining means comprises selection means for selecting the time transform corresponding to the time transformed audio signal having the smallest frequency change over said predetermined amount of time for the purpose of reconstructing the signal with improved quality.

As per claim 12, Taori discloses a transmitter according to claim 9. Taori fails to disclose the transmitter according to claim 9 wherein the encoder comprises time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in

such a way that the time transformed audio signal has a smaller frequency change than the audio signal. The above features are well known in the art as taught by Wang.

Wang teaches increasing the pitch by a frequency increase (column 4, lines 57-58), and reducing the pitch of the sound signal resulting in a frequency drop (column 5, lines 8-9). Increasing the frequency is equivalent to time compressing the signal, and reducing the frequency is equivalent to time expanding the audio signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmitter of Taori to further include time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal for the purpose of increasing the accuracy of the reconstruction of the audio signal.

As per claim 14, Taori discloses a receiver according to claim 13. Taori fails to disclose a receiver according to claim 13 wherein the decoder comprises time transforming means for obtaining the reconstructed audio signal by time transforming a decoded signal wherein the tie transforming means are arranged for time expanding the decoded signal during a first part of the predetermined amount of time and for time compressing the decoded signal during a second part of the predetermined amount of time in such a way that the time transformed decoded signal has a larger frequency change than the decoded signal. The above features are well known in the art as disclosed by Wang.

Wang teaches reducing the pitch of the sound signal resulting in a frequency drop (column 5, lines 8-9), and increasing the pitch by a frequency increase (column 4, lines 57-58). Reducing the frequency is equivalent to time expanding the audio signal, and increasing the frequency is equivalent to time compressing the signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the receiver of Taori characterized in that the decoder comprises time transforming means for obtaining the reconstructed audio signal by time transforming a decoded signal wherein the time transforming means are arranged for time expanding the decoded signal during a first part of the predetermined amount of time and for time compressing the decoded signal during a second part of the predetermined amount of time in such a way that the time transformed decoded signal has a larger frequency change than the decoded signal for the purpose of increasing the accuracy of the reconstruction of the audio signal.

As per claim 16, Taori discloses an encoder according to claim 15. Taori fails to disclose the encoder according to claim 15 wherein the encoder comprises time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal. The above features are well known in the art as taught by Wang.

Wang teaches increasing the pitch by a frequency increase (column 4, lines 57-58), and reducing the pitch of the sound signal resulting in a frequency drop (column 5, lines 8-9).

Increasing the frequency is equivalent to time compressing the signal, and reducing the frequency is equivalent to time expanding the audio signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the encoder of Taori to further include time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal for the purpose of increasing the accuracy of the reconstruction of the audio signal.

As per claim 18, Taori discloses a decoder according to claim 17. Taori fails to disclose the decoder of claim 17 wherein the decoder comprises time transforming means for obtaining the reconstructed audio signal by time transforming a decoded signal wherein the time transforming means are arranged for time expanding the decoded signal during a first part of the predetermined amount of time and for time compressing the decoded signal during a second part of the predetermined amount of time in such a way that the reconstructed audio signal has a larger frequency change than the decoded signal. The above features are well known in the art as taught by Wang.

Wang teaches increasing the pitch by a frequency increase (column 4, lines 57-58), and reducing the pitch of the sound signal resulting in a frequency drop (column 5, lines 8-9). Increasing the frequency is equivalent to time compressing the signal, and reducing the frequency is equivalent to time expanding the audio signal. Therefore, it would have been

obvious to one of ordinary skill in the art at the time the invention was made to modify the decoder of Taori to further include time transforming means for obtaining the reconstructed audio signal by time transforming a decoded signal wherein the time transforming means are arranged for time expanding the decoded signal during a first part of the predetermined amount of time and for time compressing the decoded signal during a second part of the predetermined amount of time in such a way that the reconstructed audio signal has a larger frequency change than the decoded signal for the purpose of increasing the accuracy of the reconstruction of the audio signal.

As per claim 20, Taori discloses a method according to claim 19. Taori fails to disclose a method according to claim 19, further comprising deriving a time transformed audio signal and time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal. The above features are well known in the art as taught by Wang.

Wang teaches increasing the pitch by a frequency increase (column 4, lines 57-58), and reducing the pitch of the sound signal resulting in a frequency drop (column 5, lines 8-9). Increasing the frequency is equivalent to time compressing the signal, and reducing the frequency is equivalent to time expanding the audio signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Taori to further include time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio

signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal for the purpose of increasing the accuracy of the reconstruction of the audio signal.

As per claim 22, Taori discloses a method according to claim 21. Taori fails to disclose the method of claim 21 further comprising deriving the reconstructed audio signal by a time transforming of a decoded signal wherein the time transforming comprises time expanding the decoded signal during a first part of the part of the predetermined amount of time in such a way that the time transformed decoded signal has a larger frequency change than the decoded signal. The above features are well known in the art as taught by Wang.

Wang teaches increasing the pitch by a frequency increase (column 4, lines 57-58), and reducing the pitch of the sound signal resulting in a frequency drop (column 5, lines 8-9). Increasing the frequency is equivalent to time compressing the signal, and reducing the frequency is equivalent to time expanding the audio signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Taori to further include time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal for the purpose of increasing the accuracy of the reconstruction of the audio signal.

4. Claims 6, 7, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taori (US Patent No. 6,078,879) in view of Wang (US Patent No. 5,647,005) and further in view of Sluijter ("A Time Warper For Speech Signals," Proceedings of IEEE Workshop on Speech Coding Proceedings. Model, Coders, and Error Criteria, Porvoo, Finland, 20-23, June 1999, pages 150-152).

As per claim 6, Taori as modified by Wang discloses a transmission system according to claim 5. Taori fails to disclose the transmission system of claim 5, wherein the time transform determining means are arranged for selecting the time transformed audio signal having the smallest frequency change over said predetermined amount of time by selecting the time transformed audio signal having the highest peak in its autocorrelation function. Selecting the time transformed audio signal having the highest peak in its autocorrelation function is well known in the art as disclosed by Sluijter. Sluijter discloses selection criteria on the maximum pitch-related peak value of the autocorrelation function (p. 151, left column, lines 39-40).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission system of Taori to further include arranging the time transform determining means for selecting the time transformed audio signal having the smallest frequency change over said predetermined amount of time by selecting the time transformed audio signal having the highest peak in its autocorrelation function in order to optimally warp the audio signal to obtain a signal with the most constant frequency.

As per claim 7, Taori as modified by Wang discloses a transmission system according to claim 4. Taori fails to disclose the transmissions system according to claim 4 wherein the time transform is defined by a quadratic relation between the actual time and the transformed time. The aforementioned feature is well known in the art as taught by Sluijter.

Sluijter discloses a time warper of the form $\tau(t) = a/T * t^2 + (1-a)*t$; $0<= t <= T$ which is in quadratic form (p. 150, equation (1), and column 1, lines 41-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission system of Taori to further include a time transform is defined by a quadratic relation between the actual time and the transformed time for the purpose of only removing frequency variations which progress linearly with time since the linear part represents the major part of the frequency variation in a speech segment.

As per claim 8, Taori as modified by Wang discloses a transmission system according to claim 7. Taori fails to disclose a transmission system according to claim 7 wherein the relation between the actual time t and the transformed time τ is defined by

$\tau(t) = a/T * t^2 + (1-a)*t$; $0<= t <= T$ in which a is a parameter defining the time transform and T is the duration of a signal segment. The aforementioned feature is well known in the art as taught by Sluijter.

Sluijter discloses a parabolic time warper of the form: $\tau(t) = a/T*t^2 + (1-a)*t$; $0<= t <= T$.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission system of Wang characterized in that the relation between the actual time t and the transformed time τ is defined by $\tau(t) = a/T * t^2 + (1-a)*t$; $0<= t$

<= T in which a is a parameter defining the time transform and T is the duration of a signal segment for the purpose of only removing frequency variations which progress linearly with time since the linear part represents the major part of the frequency variation in a speech segment.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kinari Patel whose telephone number is 703-305-8487. The examiner can normally be reached on 9 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 703-305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

kp

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER